ACTUARIAL REPORT

on the

PUBLIC SERVICE GROUP INSURANCE FUND

as at

DECEMBER 31st, 1988

TURNBULL and TURNBULL

Chairman and Members,
Civil Service Superannuation Board,
Winnipeg, Manitoba.

1. Purpose

The Public Servants Insurance Act (Act) was adopted by the legislature in 1975. This Act created a Group Insurance Fund and gave the Civil Service Superannuation Board (Board) responsibility for administering the insurance plans which were established under the former Act or under this Act. The new Act also required a periodic Actuarial Report on the status of the Public Service Group Insurance Fund (Fund). The first Actuarial Report was made as at December 31st, 1976 (1976 Report). Reports are required to be made at least once every 3 years. The last report was made as at December 31st, 1985 (1985 Report). Therefore, an actuarial valuation of the Fund has been made as at December 31st, 1988.

The purpose of these reports is to:

(a) indicate the financial position of each part of the Fund,

(b) evaluate the sufficiency of the contribution rates currently being paid by employees and participating employers, and

(c) indicate the apparent break even premium rates for each plan of insurance and, where appropriate, for each type of insurance protection based on the present and possible future distribution of insurance by age and sex.

2. Sources of Information

The data on which the valuation is based included:

(a) A tape containing information for each employee participating in the Fund and the Civil Service Superannuation Fund (C.S.S.F.). The details of the information provided included: employer code, employee number, social insurance number, sex, date of birth, actual earnings in 1988, proportion of year worked in 1988, annualized salary, class of insurance code, amount of insurance and dependent's insurance code.

(b) A listing providing information for each employee participating in the Fund and the Teachers' Retirement Allowances Fund (T.R.A.F.). The details of the information provided included: name, social insurance number, sex, date of birth, annual salary, class of insurance code, amount of insurance and dependent's insurance code.

(c) A listing providing similar information for each member of the Manitoba Legislative Assembly (M.L.A.) who is participating in the Fund.

(d) A computer printout providing information for each employee of the Workers' Compensation Board (W.C.B.)participating in the Fund and the Retirement Plan for Employees of the W.C.B. The details of the information provided included: name, social insurance number, sex, date of birth, annual salary, class of insurance code, amount of insurance and dependents' insurance code.

(e) A listing providing information for each Departmental Employee (casual and time-certificate) of the Department of Highways participating in the Fund but not participating in the C.S.S.F. The details of the information provided included: name, social insurance number, sex, date of birth, salary received in 1988, class of insurance code, amount of insurance and dependents' insurance code.

(f) A listing providing information for each Departmental Employee (casual and time-certificate) of the Department of Mines participating in the Fund but not participating in the C.S.S.F. The details of the information provided included: name, social insurance number, sex, date of birth, salary received in 1988, class of insurance code, amount of insurance and dependents' insurance code.

(g) Diskettes containing information for each retired employee participating in the Fund. The information provided included: name, social insurance number, sex, date of birth, date of retirement, class of insurance code, amount of insurance and dependents' insurance code.

(h) Three additional listings which provided similar information for each other retired employee participating in the Fund but not receiving a pension from the C.S.S.F.

(i) Listings which provided information for each employee at December 31st, 1988 whose contributions were being waived as a result of total disability.

(j) A copy of the Auditor's Report and financial statements for the Fund for the policy years ending April 30th, 1986, April 30th, 1987 and April 30th, 1988. In addition, interim financial statements were provided as at December 31st, 1988.

(k) A copy of Policy Number G. 2750 under which The Canada Life Assurance Company provides life insurance and accidental death and disablement insurance.

(l) A copy of Policy Number G. 3105 under which The Canada Life Assurance Company provides dependents' life insurance.

(m) A copy of the Public Servants Insurance Act.

(n) A copy of the financial statements, prepared by The Canada Life Assurance Company, for the 2 insurance policies. These statements provided information for the policy years ending April 30th of 1987, 1988 and 1989.

(o) A copy of the Actuarial Report on the financial position of the C.S.S.F. as at December 31st, 1986 (1986 Superannuation Fund Report).

(p) Copies of the Actuarial Reports on the Public Service Group Insurance Fund as at December 31st, 1982 (1982 Report) and December 31st, 1985 (1985 Report).

The data provided as at December 31st, 1988 was reviewed for missing information, illogical information, and was also compared to the data provided as at December 31st, 1985.

As a result of these procedures, changes were made to approximately 1,000 records. There were 34,697 records for members participating in the Fund as at December 31st, 1988.

The quality of the data provided continues to be satisfactory for valuation purposes.

3. Operation of the Plans

Three Plans of insurance have been created in accordance with the authority granted under the Act. These Plans consist of:

(a) The Group Life Insurance Plan for employees of the Province and its boards and agencies. Retired and disabled employees can continue to be insured if they were insured prior to retirement or disablement. This insurance protection is provided by The Canada Life Assurance Company under Policy Number G. 2750.

(b) The Accidental Death and Disablement Insurance Plan for employees who are participating in the Group Life Insurance Plan. Former employees are not insured under this Plan. This insurance protection is provided by The Canada Life Assurance Company under Policy Number G. 2750.

(c) The Dependents' Group Life Insurance Plan for the eligible dependents of those employees who are participating in the Group Life Insurance Plan and have elected to insure their dependents. Eligible dependents of retired and disabled employees can continue to be insured if the dependents were insured prior to the date on which the employee retired or became disabled. This insurance protection is provided by The Canada Life Assurance Company under Policy Number G. 3105.

4. Summary of Group Life Insurance Plan

(a) Each employee is able to elect one of 4 classes of life insurance protection.

Evidence of good health is not required if this election is made at the date of becoming eligible. Evidence of good health is required if an employee wishes to increase the amount of life insurance protection after that date.

(b) The amount of life insurance protection provided depends upon the insurance class chosen. If Class I is chosen and the employee has not attained age 51 the amount of protection is equal to one times annual salary or $37,500 whichever is the smaller amount. At age 51 the amount of protection begins to reduce. The reduction is approximately 2.5% per year until age 65 and 5.0% per year thereafter.

The amount of protection provided under Class II, Class III and Class IV are multiples of the protection provided under Class I.

(c) The contributions for this insurance protection are shared by the employees and participating employers.

These contributions are based on salary and insurance class. Contributions for an employee are waived if the employee becomes totally disabled.

(d) The amount of life insurance protection provided after retirement is a percentage of the insurance protection in effect immediately before retirement. The protection reduces at each age until age 73. At age 73 and later $1,000 life insurance protection is provided.

(e) The contributions paid after retirement are equal to the contributions paid by the employee on the last pay day before retirement. The contributions paid by participating employers cease when an employee retires.

(f) The amount of protection will be increased if an insurance dividend is in effect at the date of death.

(g) Insurance protection ceases on termination of employment other than due to retirement.

5. Summary of Accidental Death and Disablement Insurance Plan

(a) The amount of insurance protection provided is dependent on the class of insurance elected by an employee under the Group Life Insurance Plan.

If the employee elects Class I, the protection is equal to one times annual salary or $25,000 whichever is the smaller amount.

If the employee elects Class II the protection is equal to 2 times annual salary or $50,000 whichever is the smaller amount.

If the employee elects Class III or Class IV the protection is equal to 3 times annual salary or $75,000 whichever is the smaller amount.

(b) Benefits are paid if the employee dies or becomes totally disabled as a result of injuries caused by an accident. Total disablement must occur within 365 days of the accident.

(c) The employers pay all of the contributions for this insurance protection. These contributions are based on salary and insurance class.

(d) No protection is provided after retirement or other termination of employment.

6. Summary of Dependents Group Life Insurance Plan

(a) An employee who is participating in the Group Life Insurance Plan can elect to insure his spouse and eligible dependent children.

No evidence of health is required if the election is made at the date an employee begins to participate in the Group Life Insurance Plan or after acquiring dependents. Evidence of health is required if election is made at a subsequent date.

(b) If the employee elects to insure his dependents the amount of protection is equal to:

(i) $10,000 on the life of spouse, and

(ii) $2,000 on the life of each dependent child.

(c) The employees pay all of the contributions for this insurance protection. Contributions by an employee are waived if the employee becomes totally disabled.

(d) A retired employee can continue to insure his spouse until his spouse attains age 70 and can continue to insure his dependent children.

(e) Insurance protection ceases on termination of employment other than due to retirement.

7. Changes to Insurance Plans

Changes were made to the Plans effective July 1st, 1984.

These changes had a number of objectives. These objectives are as follows:

(a) Utilize the surplus then existing to increase the amount of life insurance protection provided without increasing the amounts paid by participating employers.

(b) Comply with the requirements of the Human Rights Act.

The need to comply with the Human Rights Act created some complexity that would not otherwise have existed.

The need for equity created some further complexity in the period up to July 1st, 1989.

No changes have been made to the Insurance Plans since July 1st, 1984.

8. Insurance Dividends

On May 1st, 1979, an insurance dividend was declared. Insurance dividends have been declared each year since that date.

For the year ending April 30th, 1988, the insurance dividend was equal to 10% of the insurance in force at June 30th, 1984 up to the following maximums.

Insurance Class	Maximum Amount of Increase
I	$2,675
II	5,350
III	8,025
IV	8,025

9. Contribution and Premium Rates

The contribution rates paid to the Fund and the premium rates paid to Canada Life under the 3 Plans are as follows:

Insurance	Basis for Contributions	Contribution Rate Paid to Fund		Premium Rate Paid to Canada Life	
		Bi-weekly	Monthly	Bi-weekly	Monthly
Group Life:					
Employees - Class I	per $1,000 of annual salary	12.55¢	27.30¢	11.55¢	25.12¢
Retired Employees					
(a) Retirements before 01.07.84					
- under age 65	per $1,000 of insurance	N/A	48.00¢	N/A	$1.43
- age 65 but under age 70	per $1,000 of insurance	N/A	96.00	N/A	1.43
(b) Retirement after 01.07.84					
- initial (Note 1)	(Note 2)	N/A	24.00¢	N/A	50.88¢
- ultimate (Note 1)	(Note 3)	N/A	20.00	N/A	42.40¢
A.D.& D.:					
All employees	per $1,000 of insurance	2.10¢	4.57¢	1.54¢	3.35¢
Dependents Group Life:					
All participating employees	per employee	$1.03	$2.24	$1.03	$2.24

Notes:

1. The initial contribution rate applies to employees who retired in the first 12 months following July 1st, 1984. The ultimate contribution rate applies to employees who retire on or after July 1st, 1989. For employees who retire between July 1st, 1985 and June 30th, 1989, the contributions are a proration of the contributions produced using the initial contribution rate and the ultimate contribution rate. The proration is based on the complete years since July 1st, 1984.

2. Applied to the amount of life insurance in effect on June 30th, 1984.

3. Applied to annual salary immediately prior to retirement used for contributions purposes, increased by the appropriate multiple corresponding to the employee's Insurance Class.

10. Contribution Sharing Arrangement

The contributions are shared on the following basis:

	Sharing Arrangement		
Insurance	Employees	Employers	Fund
Group Life Insurance:			
All Employees except Liquor Commission	72.5%	27.5%	-
Liquor Commission employees			
- Class I, II, III	-	100.0	
- Class IV	50.0	50.0	
Additional Life Insurance for employees (due to minimum tests)	-	-	100.0%
Retired employees (See Note)	47.2	-	52.8
Accidental Death and Disablement Insurance	-	100.0	-
Dependents' Group Life Insurance	100.0	-	-

Note:

The percentages shown are applicable to the ultimate sharing arrangement which will come into effect on July 1st, 1989. As indicated, employees who retire after July 1st, 1989 pay 20¢ per month per $1,000 of salary used for contributions purposes, increased by the appropriate multiple corresponding to employee's Insurance Class. The premiums paid to Canada Life are 42.40¢ per month per $1,000 of insurance. The contribution rate paid by retired employees is 47.2% of this premium rate.

11. Financial Arrangements

Each of the policies describes the financial arrangements between the Province and Canada Life. These consist of:

(a) the premium rates which are to be paid for each type of insurance protection,

(b) the charges made by Canada Life for the services it provides,

(c) the method to be used to determine experience refunds or deficits, and

(d) the effect which termination of the policy has on the amounts paid and received.

Group Life Insurance Plan

The policy issued by Canada Life for the Group Life Insurance Plan requires an annual tabulation of the amounts credited to and charged against this part of the policy during the policy year just completed. The amounts credited and charged to this part of the policy each year consist of:

Credits

(a) premiums paid to Canada Life,

(b) interest on waiver of premium reserves, and

(c) interest on the cash flow,

Less

Charges

(a) claims incurred,

(b) instalment disability payments,

(c) conversion charges,

(d) charges made for services provided,

(e) premium taxes, and

(f) a risk charge.

The claims incurred under this policy include the payments made on the death of employees, retired employees or disabled employees.

These claims are reduced by the cancellation of waiver of premium reserves held by Canada Life. Such reserves are cancelled upon the death, recovery or attainment of age 65 of an employee for whom a waiver of premium reserve was established. These reserves are maintained only for waiver of premium claims incurred prior to May 1st, 1972. As at April 30th, 1988 the value of this reserve was equal to $84,400.

No other reserves are being maintained by Canada Life under basic life insurance.

It is possible for a number of participants to die as a result of one accident. A limit has been placed on the amount which can be charged against the policy if this happens. The limit cannot exceed 3 times the maximum benefit. For the Employee's Group Life Plan this limit is $450,000. The charge for providing this limit was $7,425 for the year ending April 30th, 1988.

The instalment disability payments are for employees of Hydro who became disabled prior to July 1st, 1984.

Conversion charges are assessed if an employee elects to retain his life insurance protection when he retires or his employment terminates. These charges are based on the amount of life insurance being converted and on the age of the employee. The following table illustrates the conversion charges being assessed by Canada Life:

Age at Date of Conversion	Charges per $1,000 of Insurance Protection Converted
30	$ 30
40	45
50	85
60	145
65	175

For the 3-year period ending on April 30th, 1988, the average conversion charge was $69 per $1,000 of life insurance protection converted.

If the former employee agrees to and passes a medical examination then the conversion charges are waived.

The charge made for the services provided by Canada Life is equal to .9 of 1% of premiums for the policy year ending April 30th, 1988.

The actual amount of taxes assessed by the Province on insurance premiums is tabulated and charged.

At the end of each policy year Canada Life agrees to pay the full amount of the surplus plus interest determined with respect to that year, less any deficits plus interest carried forward from prior years, within 8 months of the end of the policy year.

If this policy is terminated, the surplus or deficit is calculated as if the policy was still in effect. If on the final settlement date there is a surplus after taking into account any surplus or deficits plus interest carried forward from prior years, Canada Life will pay the amount of the surplus plus interest as a final settlement. If there is a deficit, Canada Life will be paid that amount plus interest from the Group Life Insurance part of the Fund or from the Province of Manitoba if this amount is insufficient.

In summary, the financial arrangement with Canada Life for the Group Life Insurance Plan has the following features:

(a) Experience refunds are paid by Canada Life if the amounts charged to the policy are less than the amounts credited to the policy; a deficit is carried forward to the following policy year.

(b) Interest is added to any surplus from the end of the policy year to the date the experience refund is paid by Canada Life.

(c) Interest is charged on any deficit from the end of the policy year to the date the deficit is recovered as a result of a subsequent surplus.

(d) No reserves are maintained by Canada Life other than the reserves created in respect of employees who became disabled prior to May 1st, 1972.

(e) Interest is credited to the reserves created in respect of employees who became disabled prior to May 1st, 1972.

(f) Any surplus which emerges as a result of favourable claims experience occurring after the policy terminates is refunded; the policyholder is responsible for any deficit which exists on termination of the policy.

(g) Interest is credited or charged on cash flow at a rate equal to the rate of interest for 90-day Treasury Bills issued by the Province of Manitoba.

(h) Interest is added to death claims from date of death to date of payment.

The amounts remitted to Canada Life depend on the claims experience and the distribution of insurance by age and sex. For example, the amount remitted in regard to retired employees increases if the average age of retired employees increases.

All contributions for the group life insurance are paid into the employees' Group Life Insurance part of the Fund. The premiums for the coverage are remitted to Canada Life. The Fund receives:

(a) contributions in excess of the premiums required for life insurance prior to retirement and,

(b) experience refunds.

This part of the Fund pays:

(a) The premiums payable in respect of employees who have become disabled. These premiums are paid at the same rate as premiums paid for other employees participating in the Group Life Insurance Plan.

(b) The amount which is needed in addition to the contributions made by retired employees in order to pay the premiums charged for life insurance after retirement.

(c) The amount which is needed to finance the insurance dividend.

(d) The administrative and other expenses charged to this part of the Fund.

Accidental Death and Disablement Insurance Plan

Protection under the Accidental Death and Disablement Insurance Plan is also provided under Policy Number G. 2750. The policy issued by Canada Life for the Accidental Death and Disablement Plan requires an annual tabulation of the amounts credited to and charged against this part of the policy during the policy year just completed. The amounts credited and charged to this part of the Policy each year consist of:

Credits

(a) premiums paid to Canada Life, and

(b) interest on the cash flow.

Charges

(a) accidental death and disablement claims,

(b) a charge made for services provided,

(c) premium taxes, and

(d) a risk charge.

The charges made for services provided by Canada Life are equal to .9 of 1% of premiums plus $245 per claim for the policy year ending April 30th, 1988. In addition, these charges include any expenses incurred by Canada Life as a result of claims adjudication or litigation.

A limit has been placed on the amount that can be charged if a number of participants die or become disabled as a result of one accident. The maximum amount which can be charged against this part of the Policy as a result of one accident is 3 times the maximum benefit or $225,000. The risk charge for providing this limit was $6,075 for the year ending April 30th, 1988.

The net difference between the credits and charges for a year are carried forward to the succeeding policy year.

The amount of these net differences is tabulated for 3 policy years. If the experience is favourable interest is added to the net difference. If the experience is unfavourable interest is charged to the net difference. At the conclusion of that period an experience refund is paid if the experience has been favourable; any deficit is carried forward to the next 3-year period.

If this policy is terminated, the surplus or deficit is calculated as if the policy was still in effect. If on the final settlement date there is a surplus after taking into account any surplus or deficits carried forward from prior years, Canada Life will pay the amount of the surplus as a final settlement. If there is a deficit, Canada Life will be paid that amount from the Group Life Insurance part of the Fund or by the Province of Manitoba if this amount is insufficient.

Amounts are retained by Canada Life if there are contested claims. Interest is credited on these amounts.

Dependents' Life Insurance Plan

The premiums charged under the Dependents' Group Life Insurance Plan are paid by those employees who have elected to insure their dependents. Each year, the premiums received under this Policy are compared to the claims paid, premium taxes charged and the agreed upon service charges made by Canada Life. If gains are realized, they are used to reduce any deficit or if there is no deficit the surplus is paid as an experience refund. If the experience is unfavourable the amount of the loss becomes a charge against any future gain.

In 1982, Canada Life requested an increase in the premium rate for dependents insurance. The request was made because of the deficit position of the premium rate stabilization reserve.

The experience of the Dependents' Group Life Plan has improved over the last few years.

As a result, the deficit has been eliminated.

For the year ended April 30th, 1988 the Dependents' Group Life Plan had an operating surplus equal to $99,796. This amount was used to eliminate the accrued deficit of $88,399 and establish a Claims Fluctuation Reserve equal to $11,397.

12. Membership of the Insurance Plans

The information supplied indicated that the membership of the Plans as at December 31st, 1988 was as follows:

		Employees' Group Life Insurance Plan	Dependents' Group Life Insurance Plan	
		Group Life Insurance & Accidental Death and Disablement Insurance	Employees	Proportion of Employees with Dependents' Insurance
Employees:	Males			
	<20	6	1	16.7%
	20 - 24	665	95	14.3
	25 - 29	1,863	639	34.3
	30 - 34	2,464	1,403	56.9
	35 - 39	3,000	2,110	70.3
	40 - 44	2,870	2,332	81.3
	45 - 49	2,156	1,844	85.5
	50 - 54	1,823	1,525	83.7
	55 - 59	1,421	1,149	80.9
	≥60	852	635	74.5
		17,120	11,733	68.5%
	Females			
	<20	10	2	20.0%
	20 - 24	693	159	22.9
	25 - 29	2,073	771	37.2
	30 - 34	2,457	1,123	45.7
	35 - 39	2,277	1,210	53.1
	40 - 44	1,723	993	57.6
	45 - 49	1,155	703	60.9
	50 - 54	827	485	58.6
	55 - 59	611	324	53.0
	≥60	352	126	35.8
		12,178	5,896	48.4%
Former employees who are disabled:				
	- Males	191	144	75.4%
	- Females	86	45	52.3
Former employees who are retired:				
	- Males	3,708	1,627	43.9
	- Females	1,414	176	12.4

All employees are entitled to disability benefits. These benefits provide for waiver of contributions and a continuation of life insurance protection if the employee becomes totally disabled. This continues to age 65 if the employee continues to be totally disabled.

Retired employees are not eligible for disability benefits.

The following table shows the amounts of salaries used to determine the Group Life Insurance in force as at December 31st, 1988:

		Males	Females	Total
(a)	Employees	$1,909,565,500	$874,094,100	$2,783,659,600
(b)	Retired employees	60,853,000	12,794,000	73,647,000
(c)	Disabled employees	17,276,900	4,631,300	21,908,200
	Totals	$1,987,695,400	$891,519,400	$2,879,214,800

13. Assumptions

The results contained in this Report are based on assumptions made in respect to those factors which will affect the status of the Fund, the level of contributions required or the premium rates charged in future years.

The factors which are of financial significance are:

(a) the rate of return which will be earned on the assets of the Fund,

(b) the rates at which salaries and, consequently, the amounts of life insurance protection will increase,

(c) the incidence of death while insured,

(d) the incidence of termination of employment,

(e) the incidence of becoming disabled,

(f) the value of benefits expected to be paid to an employee who becomes disabled,

(g) the incidence of retirement,

(h) the proportion of retired members who continue to contribute for group life insurance protection after retirement,

(i) the proportion of terminating members who elect to convert to individual insurance and the charges for converting to this insurance,

(j) the expenses of administering the Plans, including the charges made by Canada Life for the services it provides,

(k) the incidence of accidental death and disablement while insured,

(l) the incidence of death amongst insured dependents, the relative age of spouses, and the average number of children.

Assumptions are developed in respect of each of these factors in order to determine:

(i) the amounts of the contributions expected to be received and the premiums expected to be paid,

(iii) the present value of these expected contributions and premiums for the purposes of establishing the present financial position of the Fund.

A study of the experience has been made. This study compares actual experience to the expected experience.

The number of deaths, terminations, disablements, and retirements which actually occurred during these periods were compared to the number expected to occur. The numbers expected to occur were calculated by using the rates of utilization assumed in the 1985 Report except for the rates of retirement. The rates of retirement used to determine the number of expected retirements were those used in the 1986 Superannuation Fund Report.

Any differences between the actual experience and expectations based on the existing assumptions, have been analyzed. Where appropriate, the assumptions used previously have been modified to reflect the results of this study of the experience.

The assumed rate of return and the expected general increases in salaries are based on experience during the 20-year period prior to the valuation date.

The experience concerning the utilization of benefits has been studied over the 3-year period and 9-year period prior to the valuation date. The experience prior to this time is not as useful in developing the rates since it does not reflect subsequent changes in the Plans and in the level of economic activity.

A description of the studies made and the assumptions adopted follows.

(a) Rate of Return on the Assets of the Fund

As at December 31st, 1988, the assets of the Fund consisted of cash, Government of Canada bonds, Provincial bonds, short-term investments with the Minister of Finance, amounts on deposit with Canada Life, accrued interest plus any amounts receivable less any amounts payable. A portion of the amounts on deposit with Canada Life are expected to be transferred to the Fund.

The rates of return earned on the assets of the Fund are as shown in the following table:

Policy Year Ending April 30th	Annual Rate of Return
1982	16.90%
1983	13.72
1984	10.99
1985	12.66
1986	11.62
1987	10.95
1988	12.56
8 months ending 31.12.88	13.66
Average 01.05.81 - 31.12.88	12.88%

These rates of return were calculated using the book value of the amounts credited to the Fund and the investment income earned during each period.

The Fund may invest in any security that is an eligible investment for the Superannuation Fund. It is to be expected that a large portion of the Fund will, in future, be invested in bonds with a variety of terms to maturity. The balance of the Fund will likely continue to be invested in short-term notes and equivalent types of investments.

An actuarial valuation relates to events which are expected to happen in the future. As a result, the rates of return obtained in past years are important only to the extent that they constitute a good indication of the rates of return which can be expected to be earned in the future.

The rate of return which the Fund can be expected to earn in future years depends on the following factors:

(i) the rate of return currently being earned on the Fund as at the valuation date,

(ii) the rate of return expected to be earned on each category of investment in which amounts are expected to be invested in the future, and

(iii) the investment policy adopted for the Fund.

The rate of return assumed in an actuarial valuation should represent a reasonable balance between the rates of return currently being earned and the rates of return which can be expected to be earned on new investments which will be made in the future.

An indication of the rates of return likely to be available in future years can be obtained from a study of the rates which have been available over a period in the past. It is important that the period studied be long enough to include a variety of economic conditions. This is achieved by using a 20-year period. In this Report, we have used the 20-year period ending December 31st, 1988.

A period as long as 20 years allows the effect of a variety of economic conditions to be reflected in the result obtained. It reduces the fluctuations and distortions which can occur, over shorter periods of time, due to business conditions and government controls.

If each month, for 20 years, equal amounts had been invested in federal bonds, the average rate of return would have been 10.06% per year. This calculation was made by using yields obtained from the Scotia McLeod Long-Term Canada Index.

It is desirable to make allowance for the possibility that the rates of return which are available in the future may be less than the rates of return which were available during the latest 20-year period.

This allowance could be made by excluding, from the calculation, the very high rates of return that were available during 1981 and the first 6 months of 1982. If this is done, the 20-year average rate of return becomes 9.64% per year.

The rate assumed is also affected by the following considerations.

In recent years, the financial markets enabled investors to get very favourable rates of return for investments in bonds and mortgages. The differences between the rates of interest available on new fixed income investments and the rates of inflation currently being experienced are several times what these differences have been over longer periods of time in the past. In the past, such periods have been followed by periods when the rates of return have not been as favourable.

It is important to take into account the effect which a decrease in the rate of inflation will have on the rates of return obtained in the future. The need to make allowance for this possibility is greater when the rate of inflation currently being experienced is less than the rate of inflation experienced over the applicable parts of the 20-year period.

A decrease in the rate of return has an adverse effect on the financial position of the Fund. This adverse financial effect is experienced even if there is a corresponding reduction in the rate of inflation.

It is also important to recognize that there are liquidity requirements which, at times, will cause more of the Fund to be invested in short-term notes and shorter-term bonds than would be so invested if such requirements did not exist. Allowance has been made for these requirements by reducing the assumed rate of return by .25 of 1%.

On the basis of the foregoing considerations, it is reasonable to assume that the Fund will earn a rate of return of at least 8.75% per year on average in the future.

The following table summarizes the adjustments made in determining the assumed rate of return:

Calculation based on 20-year average and investment in federal bonds	10.06%
Effect of removing 1981 and first 6 months of 1982 from 20-year averages	(.42)
Allowance for the effect of liquidity requirements on the choice of investments	(.25)
Allowance for less favourable investment experience in the future	(.64)
Assumed rate of return	8.75%

The assumed rate of return will be the same as the actual rate if investments are in federal bonds and no gains or losses are realized on the sale of these investments. The same or better results would be achieved if any losses are more than offset by an increase in investment income.

A portion of the assumed rate of return is attributable to the expectation that inflation will exist in future. Inflation causes a decrease in purchasing power. Knowledgeable investors have sought to offset this decrease by charging rates of interest which, on average, make allowance for the expected rate of inflation during the term of the investment. This allowance is added to the real rate of return desired by the investor to produce the rate of interest charged on that investment.

This decrease in purchasing power can be measured by determining the average annual rate of increase in the Consumer Price Index. During the 20 years ending December 31st, 1988, the Consumer Price Index increased by an average of 6.87% per year.

This increase is also affected by the elimination of the increases in the Consumer Price Index during 1981 and the first 6 months of 1982 from the period covered by the average. If that is done, the increase in the Consumer Price Index over the period is 6.44% per year.

If the inflationary component in the assumed rate of return of 8.75% is 6.50%, the real rate of return is expected to be 2.25% per year.

There are 2 reasons for identifying the 2 parts of the assumed rate of return. These are:

(i) to ensure consistency in the choice of economic assumptions. The assumed rate of return is based on an assumption as to future economic conditions. So also is the assumption made as to the rate at which salaries will increase in future years. Consequently, in order to ensure consistency, the same allowance for inflation, i.e. 6.50% per year, is used in developing both actuarial assumptions, and

(ii) to give a good indication of the rate of return required to be obtained. The assumptions of a real rate of return of 2.25% per year implies that new investments obtained for the Fund are expected to yield a rate of return of 2.25% per year in excess of the average rate of inflation during the period these investments are held.

(b) Rates of Salary Increase

Salary increases occur as a result of:

(i) general increases. These increases in salary are granted to all employees and reflect changes in economic conditions, and

(ii) service, merit, and promotional increases. These increases in salary are granted on an individual basis to recognize an employee's service and increased value to the employer.

Each class of increase is considered separately in developing the rates at which salaries can be expected to increase in the future.

(i) General Increases in Salary Levels

The 2 components of general increases in salaries are:

(A) the inflationary component. Employees seek increases in salary in order to offset any decreases in the purchasing power which are caused by inflation, and

(B) the productivity component or increase in the standard of living component. The productivity component consists of that portion of general increases in salaries which are not offset by inflation. These increases are due to factors such as increases in the real value of goods and services produced per employed person. An increase in productivity is made possible by the greater use of automated or other equipment. Other increases can occur as a result of increases in qualifications needed to fulfill a position.

The inflationary component of future increases in salaries should be the same as the inflationary component included in the rate of return assumed to be earned on the assets of the Fund in future years. As explained in the previous subsection of this Report, the period used requires the allowance made for inflation in the future to be at the rate of 6.50% per year.

The productivity component is based on a study of increases in the average earnings of employed persons in Canada during the 20-year period ending December 31st, 1988. The productivity component is obtained by deducting the inflationary component from these increases in earnings. During this period, the productivity component was equal to .96 of 1% per year.

As a result, an allowance of 1.00% per year has been made for the productivity component of general salary increases. This is the same as the allowance which was made in our 1985 Report.

The expected general increase in salary is obtained by adding together the increases expected to occur in each component. On that basis, general increases in salary are expected to occur at a rate equal to 7.50% per year in future. This rate consists of an average anticipated productivity increase of 1.00% per year plus an allowance for future inflation at a rate of 6.50% per year.

(ii) Service, Merit and Promotional Increases

The assumptions made regarding increases in salary due to service, merit or promotion are the same as those adopted for use in the 1986 Superannuation Fund Report.

(c) Incidence of Death While Insured

(i) Death in Service

A study was made of death claims amongst covered employees. The results of this study are shown in the following table:

	1986 - 1988			1980 - 1988		
	Actual	Expected	Ratio	Actual	Expected	Ratio
Males	110	169	65%	361	489	74%
Females	36	44	83	93	113	82
Total	146	213	69%	454	602	75%

The actual number of deaths was less than the number expected to occur during both the 3-year period and 9-year period prior to the valuation date.

For the 1985 Report these rates of mortality were reduced.

For this Report a further reduction in the rates of mortality was made. The reduction was made to reduce, by about 50%, the difference between the actual number of deaths and the number expected to occur during the 9-year period prior to the valuation date.

On the basis of these new rates of mortality, 411 deaths amongst males and 101 deaths amongst females would have been expected to occur during the 9-year period prior to the valuation date.

(ii) Death After Retirement

A study was made of the rates of mortality after pension commences. This study differentiated between:

(A) employees who retired in at least average health, and

(B) employees who retired due to total disability.

This separation is necessary as there is a significant difference in the mortality rates of these 2 groups of former employees.

The experience of these 2 groups is described below:

(A) Employees who Retired in at Least Average Health

The results of the study of mortality amongst employees who retired in at least average health are shown in the following table:

	1986 - 1988			1983 - 1988		
	Actual	Expected	Ratio	Actual	Expected	Ratio
Males	263	282	93%	613	620	99%
Females	59	58	101	123	125	99
Total	322	340	95%	736	745	99%

The actual number of deaths was similar to the number expected to occur during both the 3-year period and 6-year period prior to the valuation date.

As a result, the existing rates of mortality applicable after retirement have been continued in use for the Report.

(B) Employees who Retired due to Total Disability

For the 1985 Report, the rates of mortality adopted for disabled lives were made equal to 2/3 of the mortality rates contained in the 1970 Group Life Premium-Waiver Valuation Tables. These rates are based upon the combined experience of 12 major life insurance companies. The ultimate portion of these rates have been used to determine the expected number of deaths in our latest study.

The results of the study of mortality amongst disabled lives is shown in the following table:

	1986 - 1988		
	Actual	Expected	Ratio
Males	38	39	98%
Females	7	18	38
Total	45	57	79%

The actual number of deaths amongst males is similar to the number expected to occur during the 3-year period.

The actual number of deaths amongst females is less than the number expected to occur during the 3-year period. There is little accumulated experience amongst females.

As a result, the existing rates of mortality applicable to disabled lives have been continued in use for this Report.

(d) Incidence of Termination of Employment

The rates of termination of employment used for this Report are the same as those used for the 1986 Superannuation Fund Report. These rates of termination were based on terminations leading to a cash settlement, retention of a deferred pension or some combination of both.

For the 1985 Report, a scale of select factors was developed which when applied to the ultimate rates of termination produced the rates of termination at durations of service of 4 years or less. These select factors were as follows:

Service	Factor
<1	2.00
1	1.60
2	1.40
3	1.25
4	1.10

For this Report, these factors were reviewed. As a result of this review, it was decided to continue in use these factors for this Report.

(e) Incidence of Disability

A study was made of those disablements which caused contributions to be waived. The results of this study are shown in the following table:

	1986 - 1988			1980 - 1988		
	Actual	Expected	Ratio	Actual	Expected	Ratio
Males	118	78	151%	270	238	114%
Females	44	32	138	105	85	124
Total	162	110	147%	375	323	116%

The actual number of disablements was greater than the number expected to occur during both the 3-year period and 9-year period prior to the valuation date.

For the 1985 Report the rates of disablement amongst males were reduced and the rates of disablement amongst females were increased.

All of the greater than expected number of disablements amongst males during the 9-year period is due to the experience in the most recent 3-year period. Most of the greater than expected number of disablements amongst females during the 9-year period is due to the experience in the most recent 3-year period.

This experience was affected by the establishment of a long-term disability income plan for employees of the Province and for employees of a number of boards and agencies. These plans are expected to continue to be in effect and consequently will continue to have an impact on this part of the experience.

As a result, the rates of disablement were increased. The increase was made to reduce, by about 50%, the difference between the actual number of disablements and the number expected to occur during the 3-year period prior to the valuation date.

On the basis of these new rates of disability, 98 disablements amongst males and 39 disablements amongst females would have been expected to occur during the 3-year period prior to the valuation date.

(f) Value of Disability Benefits

If an employee becomes disabled, he is eligible for a waiver of contributions.

This benefit permits the continuation of an employee's insurance if the employee becomes totally disabled. The contributions which the employee would otherwise have made are waived up to age 65 or earlier recovery. After age 65, contributions resume. The amount contributed is the same as the amount contributed by other retired employees.

For the 1985 Report the value at the date of disability of the waiver of contribution benefits was based upon the full recovery rates and 2/3 of the mortality rates contained in the 1970 Group Life Premium-Waiver Valuation Table. As indicated, these rates are based upon the combined experience of 12 major life insurance companies. These rates were used to estimate the likelihood, at each duration of disablement, that a disabled person will recover or die while his insurance is in force.

These rates have been continued in use for this Report.

(g) Incidence of Retirement

For the 1985 Report the rates of retirement adopted were the rates used for the 1983 Superannuation Fund Report. For this Report it was decided to start with the rates used for the 1986 Superannuation Fund Report and make a further study of the retirement experience in the most recent 3-year period. This was done because of the need to properly reflect the cost to the Fund of subsidizing the cost of insurance applicable after retirement.

The results of the study of retirement prior to age 65 are shown in the following table:

	1986 - 1988		
	Actual	Expected	Ratio
Males	747	573	130%
Females	264	274	96
Total	1,011	847	119%

The actual number of retirements amongst males was greater than the number expected to occur during the 3-year period prior to the valuation date.

The actual number of retirements amongst females was close to the number expected to occur during the 3-year period prior to the valuation date. However, there were significant variations in the experience at the individual ages.

As a result, the rates of retirement were adjusted. The adjustment was made to reduce, by about 50%, the difference between the actual number of retirements and the number expected to occur during the 3-year period prior to the valuation date.

On the basis of these new rates of retirement, 660 retirements amongst males and 269 retirements amongst females would have been expected to occur during the 3-year period prior to the valuation date.

(h) Proportion of Members Continuing to Contribute After Retirement

On retirement, a participant may elect to:

(i) continue to contribute for Group Life Insurance,

(ii) cease making contributions.

A large percentage of participants continue to make contributions. Over the 3-year period ending December 31st, 1988, 1,265 of 1,437 or 88% of the employees who retired elected to continue making contributions.

Those who ceased making contributions are insured for $1,000.

For the 1985 Report it was assumed that all retiring participants would continue to make contributions for Group Life Insurance. This assumption has been continued in use for this Report.

This assumption makes an allowance for the possibility that, in future, a larger proportion of employees will elect to contribute for Group Life Insurance after retirement.

(i) Proportion of Terminating Members Converting to Individual Insurance and the Conversion Charges

The following procedure was used to evaluate the likelihood that an employee will convert his group life insurance to individual insurance if his insurance is terminating or being reduced.

In recent years the proportion of terminating employees, who elect to convert their life insurance protection, has fluctuated.

The number of employees, per 1,000 employees, who converted their insurance protection was as follows:

1983 - 1985	1986 - 1988
7	2.5

For the 1985 Report, it was assumed that 5 terminations out of every 1,000 terminating employees who have an opportunity to convert life insurance would do so. This assumption has been continued in use for this Report.

During the 3-year period prior to the valuation date the average conversion charge was equal to $69 per $1,000 of insurance converted.

For the 1985 Report it was assumed that the special charge per $1,000 of insurance converted would be equal to $75. This assumption has been continued in use for this Report.

(j) Expenses of Administering the Plans

(i) Civil Service Superannuation Board

The administration charges made by The Civil Service Superannuation Board are currently equal to .75 of 1.0% of the contributions made to the various Plans.

(ii) Professional Services

Actuarial and accounting fees are also charged to the Fund. These fees are proportional to the work required. We have assumed that these fees will be .50 of 1.0% of the contributions made to the various Plans. This is based on experience in the last 3 years.

(iii) Canada Life

For the policy year beginning May 1st, 1988, Canada Life has indicated that its charges will not exceed amounts which are slightly less than the following proportions of the premiums it receives:

(A) Employees' Group Life Insurance Plan - .9 of 1.0%.

(B) Accidental Death and Disablement Plan - .9 of 1.0% plus $245 per claim (based on premium rate of 1.54¢ biweekly).

(C) Dependents' Group Life Insurance Plan - .9 of 1.0% plus $25 per claim.

It has been assumed that charges at these levels will continue to be made in the future.

(k) Incidence of Accidental Death and Disablement while Insured

A study was made of Accidental Death and Disablement claims. The results of this study are shown in the following table:

	1986 - 1988			1980 - 1988		
	Actual	Expected	Ratio	Actual	Expected	Ratio
Males & Females	22	33	67%	69	94	73%

The actual number of claims was less than the number expected to occur during both the 3-year period and 9-year period prior to the valuation date. This is a continuation of the trend observed for the 1982 Report and 1985 Report.

As a result, the rates of accidental death and disablement were reduced. The reduction was made to reduce, by about 50%, the difference between the acutal number of claims and the number expected to occur during the 9-year period prior to the valuation date.

On the basis of these new rates of accidental death and disablement, 80 claims would have been expected to occur during the 9-year period prior to the valuation date.

(l) Dependents

The information provided identified those employees who have elected to insure their dependents. No other details were provided in respect of dependents.

For the purposes of determining the average amount of insurance protection provided on the lives of dependents information available on studies of other large groups of public sector employees was used. This information was used to assume average age differences for spouses and the average number of children per employee.

No further study was made of children's death claims because the number of children covered and their ages are not known. The number of spouses covered is known.

A study was made of the actual number of deaths amongst spouses. The results of this study are shown in the following table:

	1986 - 1988			1983 - 1988		
Spouses	Actual	Expected	Ratio	Actual	Expected	Ratio
Males	70	56	125%	123	112	110%
Females	68	51	133	129	106	122
Total	138	107	129%	252	218	116%

These results must be interpreted cautiously, since the expected number of claims includes the effects of the assumptions as to the relative ages of spouses.

The actual number of deaths was greater than the number expected to occur during both the 3-year period and 6-year period prior to the valuation date. These results are not consistent with the Dependents' Group Life Plan claims experience rating carried out by Canada Life in recent years.

As a result, the existing rates of mortality applicable to spouses were continued in use for this Report.

For the 1985 Report, rates of mortality applicable to children were adopted. These existing rates of mortality applicable to children were continued in use for this Report.

For the 1985 Report, assumptions as to differences in average age between employees and their spouses were adopted. These existing age differences were continued in use for this Report.

14. Summary of Actuarial Assumptions Used in this Report

(a) Annual Rate of Return on the Assets of the Fund - 8.75%.

(b) Annual Rate of Inflation Included in Rate of Return - 6.50%.

(c) Annual Rates of Salary Increase (including an allowance of 7.50% per year for future general increases in salary levels):

Age	Males	Females
20 - 25	14.4%	13.1%
25 - 30	12.3	11.3
30 - 35	10.7	10.2
35 - 40	9.5	9.5
40 - 45	8.7	9.4
45 - 50	8.4	8.8
50 - 55	8.1	8.5
55 - 60	8.1	8.3
60 - 65	8.0	8.2
65 - 67	7.5	7.5

(d) Incidence of Death While Insured

(i) Annual Rates of Death in Service (for selected ages):

Attained Age	Males	Females
20	.0023	.0005
25	.0008	.0005
30	.0007	.0005
35	.0010	.0006
40	.0017	.0009
45	.0026	.0015
50	.0043	.0023
55	.0070	.0033
60	.0096	.0045
64	.0118	.0056

(ii) Annual Rates of Death After Retirement (for selected ages):

Attained Age	Non-Disabled		Disabled	
	Males	Females	Males	Females
40	.0017	.0009	.0756	.0403
50	.0054	.0020	.0674	.0359
60	.0129	.0048	.0713	.0380
70	.0299	.0146	.0971	.0518
80	.0761	.0487	.1749	.0933
90	.1937	.1591	.3473	.1852
100	.4333	.4134	1.0000	1.0000

(e) Termination of employment

(i) Annual rates of termination applicable to employees with 5 or more years of service (for selected ages):

Attained Age	Males	Females
20	.1100	.2210
30	.0452	.1242
40	.0187	.0441
45	.0133	.0367
50	.0098	.0266
55	.0063	.0165
60	.0039	.0072
62	.0031	.0073

(ii) The rates of termination applicable to employees with less than 5 years of service were obtained by multiplying the above rates by the appropriate factor from the following table:

Service	Factor
<1	2.00
1	1.60
2	1.40
3	1.25
4	1.10

(f) Annual Rates of Disability (for selected ages):

Attained Age	Males	Females
35	.0001	.0002
40	.0003	.0003
45	.0006	.0005
50	.0012	.0021
55	.0063	.0057
59	.0125	.0087

(g) Value of Waiver of Contributions Benefit:

Attained Age	Value of Waiver of Contributions Benefit at Approval of Disability (per $1,000 of Insurance)
22	$ 80
27	122
32	164
37	199
42	232
47	257
52	246
57	201
62	93

(h) Annual Rates of Retirement (for selected ages):

Attained Age	Males	Females
55	.0944	.0921
57	.0493	.0547
59	.0568	.0564
61	.1168	.1324
63	.1627	.1858
65	1.0000	1.0000

(i) Proportion of Retirements where Post-Retirement Insurance Protection is expected to be elected - 100.00%.

(j) Proportion of Terminating Members Converting to Individual Insurance and the Conversion Charges:

It has been assumed that out of each 1,000 terminations, 5 persons will elect to convert their group life insurance to individual life insurance and that Canada Life will levy a conversion charge of $75 per $1,000 of life insurance converted.

(k) Expenses of Administering the Plans:

(i) Civil Service Superannuation Board

- .75 of 1.0% of total contributions made to all Plans.

(ii) Professional Services

Actuarial and Accounting - .50 of 1.0% of total contributions made to all Plans.

(iii) Canada Life

- .9 of 1.0% of premium for group life insurance protection,

- .9 of 1.0% of premium for accidental death and disablement insurance protection, plus $245 per accidental death and disablement claim,

- .9 of 1.0% of premium for dependents' life insurance protection plus $25 per dependent claim.

(l) Annual Rates of Accidental Death and Disablement (for selected ages):

Attained Age	Rates
20	.000546
30	.000279
40	.000279
50	.000338
60	.000450

(m) Dependents

(i) Annual rates of death among insured spouses:

Attained Age	Males Spouses	Females Spouses
20	.0015	.0007
30	.0009	.0004
40	.0018	.0009
50	.0055	.0027
60	.0140	.0070

(ii) Relative age of insured spouses:

Attained Age of Employee	Age of Male Spouses	Age of Female Spouses
20	22	19
30	32	28
40	43	37
50	53	46
60	64	55

(iii) Average number of children and rates of death of insured dependents:

	Males		Females	
Attained Age of Employee	Average Number of Children	Annual Rate of Death for Each Insured Child	Average Number of Children	Annual Rate of Death for Each Insured Child
20	0.2	.00139	0.1	.00139
30	1.4	.00050	0.8	.00046
40	2.4	.00043	1.8	.00044
50	1.4	.00045	0.5	.00047
60	0.5	.00047	0.0	N/A

15. Valuation Results - Present Participants

The Fund receives contributions from and on behalf of participating members and in turn remits premiums to Canada Life for the insurance protection provided. The rates of contribution paid to the Fund for the Employees' Group Life Insurance Plan and the Accidental Death and Disablement Plan are different from the premium rates paid to Canada Life.

The premiums remitted under the Employees' Group Life Insurance Plan reflect the cost of:

(a) basic life insurance protection for employees and retired employees including the $1,000 paid-up life insurance available,

(b) additional insurance due to the minimum amount test,

(c) the 10% insurance dividend, and

(d) the waiver of contributions when an employee becomes disabled.

The premiums remitted under the Accidental Death and Disablement Plan also reflect the cost of this insurance protection.

The premiums remitted under the Dependents' Group Life Insurance Plan have been made equal to the contributions received from employees.

The Fund is required to pay:

(a) the agreed upon premiums, and

(b) a share of the expenses incurred by the Superannuation Board, and

(c) the other charges incurred as a result of the operation of these Plans.

The financial position of the Fund is indicated by the relationship between:

(i) the present value of the premiums expected to be paid to Canada Life for the benefits promised and the expenses expected to be incurred, and

(ii) the present value of the funds available to finance these premiums as they become due.

The actuarial valuation is the process whereby this relationship is quantified.

The present value of the premiums is determined separately for each benefit which the Fund provides. For each benefit, each employee, and each future year of service in the Fund, we determine:

(i) the probability of a benefit becoming payable at each future age based on the actuarial assumptions outlined in the previous Section of this Report,

(ii) a discount factor which makes allowance for the portion of the benefit which it is expected will be financed by future investment earnings, and

(iii) the amount of the expected benefit. The expected benefit is calculated by using the salary expected to be received prior to the occurrence of this event.

The present value of the premiums for each benefit for each employee is the sum of the product of these 3 components over all possible future years of service for that employee. The present value of the premiums for each benefit is the sum of the present values obtained for all employees.

The present value of the premiums in respect of pensioners and former employees on waiver of contributions is determined by a similar process.

The principal sources of funds available to finance the premiums are:

(i) the present assets of the Fund, and

(ii) the contributions expected to be made to the Fund by the employees and the employers.

The present value of the contributions which are expected to be received in the future from employees already participating in the Fund are valued in a similar way. For each employee the expected contributions for each year in the future are multiplied by the probability, based on the actuarial assumptions, that the employee will still be participating in the Plan at that age in the future and by a discount factor. The present value of future contributions for each employee is the sum of the present values obtained over all possible future years of service for that employee. The present value of future contributions is the sum of the present values obtained for all employees.

The Valuation Balance Sheets reflect the financial position of each part of the Fund with respect to the present participants. While new contributors will affect the financial position, their number and distribution by age, sex and amount of insurance is much less easy to predict than the other factors taken into account in the valuation.

The following Balance Sheets anticipate that the relationship between the contributions, paid by employees or other persons participating in the Fund and on their behalf by participating employers, and the premiums paid to Canada Life will remain the same as it existed at the time this Report was prepared.

The present value of future contributions and the present value of future premiums are shown separately only if the value of future premiums exceeds the value of future contributions. Otherwise only the excess of the present value of future contributions over the present value of future premiums is shown.

The Public Service Group Insurance Fund
Employees' Group Life Insurance Plan Part
Balance Sheet
as at December 31st, 1988

ASSETS	
Plan's share of:	
- cash in bank	$ 6,808
- investments at amortized cost	30,038,526
- accrued interest on investments	383,851
Due from Dependents' Group Life Insurance Plan	27,411
Amounts held by Canada Life:	
- disability reserves	56,300
- amounts to be transferred to the Fund	2,076,107
Value of future contributions:	
- in excess of the contributions required to provide life insurance	24,371,400
Value of future contributions after retirement:	
- present retirees (healthy)	1,511,400
- present retirees (disabled)	69,000
- future retirees (healthy)	9,735,200
- future retirees (disabled)	427,000
TOTAL ASSETS	$68,703,003
LIABILITIES	
Accounts Payable:	
- to Superannuation Fund	$ 10,476
Investment Reserve	356,258
Value of future insurance benefits provided after retirement:	
- present retirees (healthy)	$ 6,181,000
- present retirees (disabled)	980,600
- future retirees (healthy)	17,688,700
- future retirees (disabled)	1,198,100
Value of future insurance benefits for present disabled employees	4,699,000
Value of waiver of future premiums for future disabled employees	14,656,400
Value of future administration expenses during next 3 years	363,500
Value of 10% insurance dividend for 1989	612,100
TOTAL LIABILITIES	$46,746,134
SURPLUS	$21,956,869

The Public Service Group Insurance Fund
Accidental Death and Disablement Insurance Plan Part
Balance Sheet
as at December 31st, 1988

ASSETS	
Plan's share of:	
- amounts held by The Minister of Finance in Trust	$4,973,502
- accrued interest	63,555
- amounts to be transferred from Canada Life	219,625
Value of future contributions:	
- in excess of contributions required to provide insurance	2,553,500
TOTAL ASSETS	$7,810,182
LIABILITIES	
Accounts Payable	$ 1,735
Investment Reserve	58,986
Value of future administration expenses during next 3 years	36,800
TOTAL LIABILITIES	$ 97,521
SURPLUS	$7,712,661

The Public Service Group Insurance Fund
Dependents' Group Life Insurance Plan Part
Balance Sheet
as at December 31st, 1988

ASSETS	
Amount held by Canada Life	$ 67,992
Value of future contributions:	
- in excess of contributions required to provide insurance	408,500
Value of future contributions after retirement:	
- present retirees	128,400
- future retirees	342,600
TOTAL ASSETS	$947,492
LIABILITIES	
Due to Employees' Group Life Insurance Plan	$27,411
Value of future insurance benefits after retirement	
- present retirees	354,000
- future retirees	525,300
Value of future administration expenses during next 3 years	17,800
TOTAL LIABILITIES	$924,511
SURPLUS	$ 22,981

16. Analysis of Valuation Results

(a) Group Life Insurance Plan Part of the Fund

The Group Life Insurance Plan part of the Fund has a surplus equal to $21,956,869 as at December 31st, 1988. The 1985 Report indicated this part of the Fund had a surplus equal to $6,815,225 as at December 31st, 1985.

The financial position as at December 31st, 1988 can be reproduced if the surplus as at December 31st, 1985 is adjusted to recognize the various changes in the financial position which occurred in the last 3 years. This procedure is demonstrated in the following schedule:

Surplus as at December 31st, 1985	$ 6,815,225
Interest earned on surplus at 9.00% per year	2,010,700
Expected surplus as at December 31st, 1988 before effect of actual experience and changes in assumptions	$ 8,825,925
Effect of actual experience	12,252,444
Surplus as at December 31st, 1988 before effect of changes in assumptions	$21,078,369
Effect of changes in assumptions	878,500
Surplus as at December 31st, 1988	$21,956,869

The following factors influenced the actual experience during the period under review and improved the financial results:

(i) The actual proceeds from investments were greater than the amounts assumed by an amount equal to $2,486,500.

(ii) The experience refunds paid by Canada Life during the valuation period were as follows:

Policy Year	Experience Refund
1986	$ 202,958
1987	(482,579)
1988	2,327,374
Total	$2,047,753

In addition to these amounts paid to the Fund during the valuation period, the amount held by Canada Life in the experience account increased by $1,891,235.

(iii) The margin in the contribution rate during the valuation period was greater than anticipated. This greater margin is caused by the greater proportion of coverage at the younger ages which occurs as salaries increase. The gain due to this source is equal to $934,600.

(iv) The greater than anticipated margin also affects the present value of future excess contributions. The gain due to this souce is equal to $4,401,900.

(b) Accidental Death and Disablement Plan Part of the Fund

The Accidental Death and Disablement Plan Part of the Fund has a surplus equal to $7,712,661 as at December, 1988. The 1985 Report indicated this part of the Fund had a surplus equal to $4,285,997 as at December 31st, 1985.

The financial position as at December 31st, 1988 can be reproduced if the surplus as at December 31st, 1985 is adjusted to recognize the various changes in the financial position which occurred in the last 3 years. This procedure is demonstrated in the following schedule:

Surplus as at December 31st, 1985	$4,285,997
Interest earned on surplus at 9.00% per year	1,264,500
Expected surplus as at December 31st, 1988 before effect of actual experience and changes in assumptions	$5,550,497
Effect of actual experience	1,502,864
Surplus as at December 31st, 1988 before effect of changes in assumptions	$7,053,361
Effect of changes in assumptions	659,300
Surplus as at December 31st, 1988	$7,712,661

The following factors influenced the actual experience during the period under review and improved the financial results:

(i) The favourable claims experience which occurred during the period. An experience refund equal to $820,241 was paid to the Fund in 1986 in respect of the Accidental Death and Disablement Plan part of the Fund.

(ii) The actual proceeds from investments were greater than the amounts assumed by an amount equal to $404,800.

(c) Dependents' Group Life Insurance Plan Part of the Fund

The Valuation Balance Sheet indicates the Dependents' Group Life Insurance Plan part of the Fund has a surplus equal to $22,981 as at December 31st, 1988.

The 1985 Report indicated that this part of the Fund had a surplus of $8,825 as at December 31st, 1985.

The increase in surplus is attributable to a small margin in the rates of contribution.

17. Premium Rates

The break-even premium rates are the premium rates which need to be paid to Canada Life in order to provide the insurance protection promised under each Plan and to pay the agreed upon charges for services and the taxes assessed. The expected break-even premium rates have been determined on the basis of the assumptions described in Section 5 of this Report and the distribution of insurance by age and sex as at December 31st, 1988.

The break even premium rates and the premium rates currently being paid to Canada Life are shown in the following table:

Insurance	Basis for Contributions	Break-Even Premium Rate		Premium Rate Paid to Canada Life	
		Biweekly	Monthly	Biweekly	Monthly
Group Life:					
- Employees - Class I	per $1,000 of annual salary	8.21¢	17.86¢	11.55¢	25.12¢
- Retired Employees	per $1,000 of annual salary at retirement	N/A	41.88¢	N/A	42.40¢
A.D.& D.:					
- All Employees	per $1,000 of insurance	1.27¢	2.75¢	1.54¢	3.35¢
Dependents' Group Life:					
- All Participating Employees	per employee	$ .89	$1.93	$1.03	$2.24

The premium rates for Class II, Class III and Class IV are multiples of the premiums for Class I.

Additional premiums are needed if an insurance dividend is granted for a policy year. The amount needed to finance an insurance dividend is determined by the size of the dividend.

For example, if the dividend is equal to 10% of the amount applicable to the insurance classification in effect on July 1st, 1984, the additional premium is about .7 of 1% of the biweekly premium per $1,000 of life insurance protection.

The foregoing information indicates that the break-even premium rates are much lower than the rates currently being paid for Group Life Insurance protection.

18. Comments and Recommendations

No changes have been made to the Plans or to the funding since July 1st, 1984. As a result, the surpluses that existed as at December 31st, 1985 have continued to grow.

Increases in surpluses have also occurred as a result of experience. During the last 3 years, the actual experience has been more favourable than expected.

This has caused a substantial increase in the surplus reported for the Group Life Insurance and the Accidental Death and Disablement Insurance parts of the Fund.

Further improvement in the financial position occurred as a result of the use of a portion of that experience in determining the expected experience in the future.

The financial position of the Dependents' Life Insurance part of the Fund is much less favourable, but is improving. Further improvements in experience are expected to occur in the future if the present rate of participation is maintained or increased in the future.

The assets of each part of the Fund together with the contributions expected to be made in future by and on behalf of present employees and retired employees are sufficient to pay the benefits promised under each Plan, as these benefits become due.

The surpluses can be used in any way considered to be desirable.

Some reduction could be made in the premium rates paid for Group Life Insurance protection.

A reduction in the premium rates paid for Dependents' Group Life Insurance protection will be possible in the next few years if claims experience continues to be favourable.

We will be pleased to discuss this Report with you at your convenience.

DATED at Winnipeg this 7th day of September, 1989.

Respectfully submitted,

Louis E Clement

Actuary

John A Trudell

Actuary